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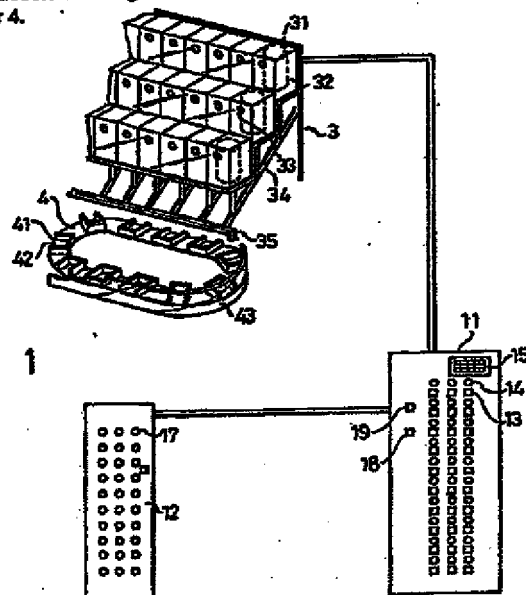
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(54) Medicine dispensing device

(57) A medicine dispensing device comprising a control unit 11 and a dispensing unit 3. The dispensing unit 3 comprises a storage shelf on which a plurality of containers 31 are disposed. Each container stores a specific medicine. Each container is incorporated with a dispensing mechanism which, after being actuated, will dispense medicines, such as tablets, pills or capsules, out of the container. The control unit comprises a main panel 11 and a secondary panel 12. The main panel 11 functions as a remote control for pharmacists to dispense medicines stored in the containers by actuating the dispensing mechanism. The secondary panel is provided for double checking the selection of medicines. Medicines pass down tracks 34 and 35 to be received in dishes 41 on conveyor 4.

FIG. 1



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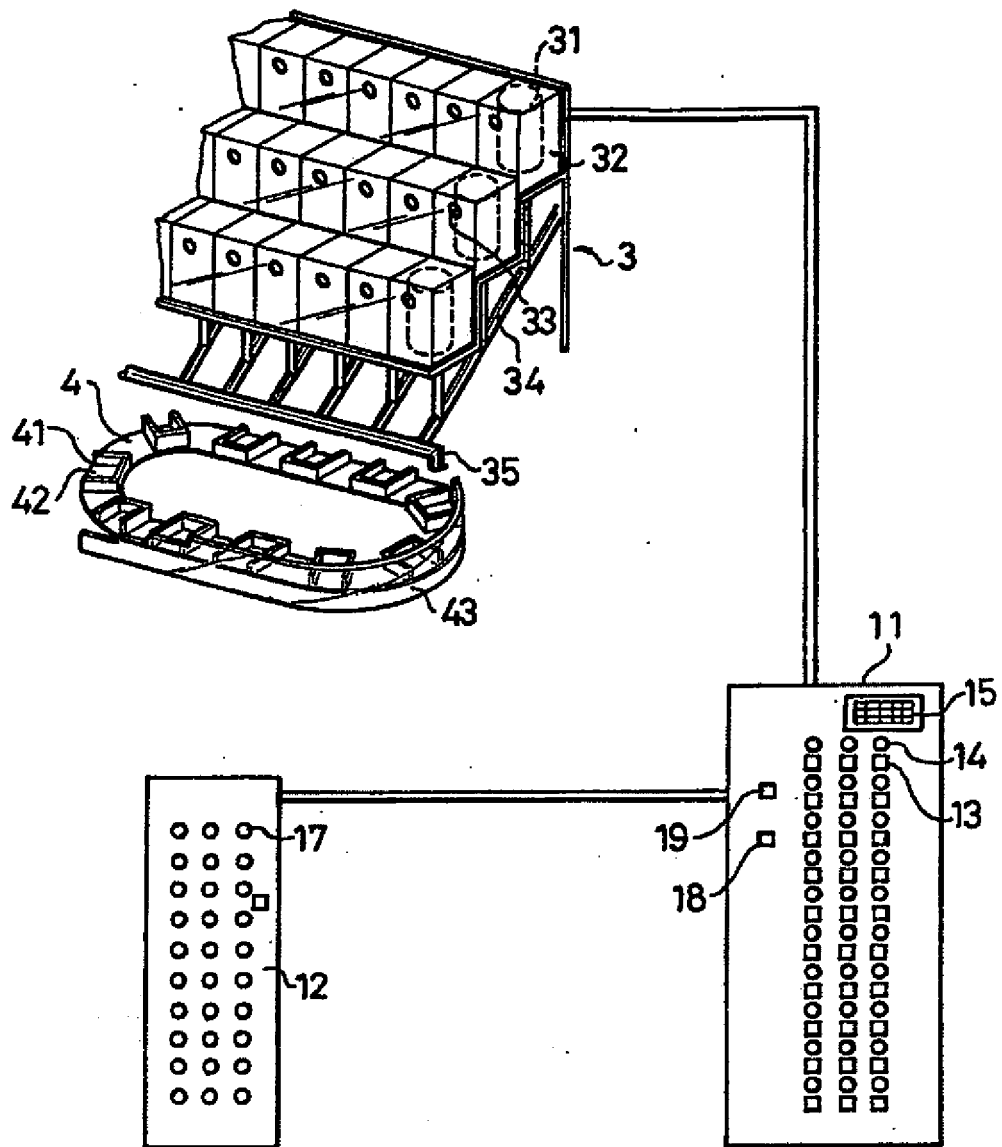


FIG. 1

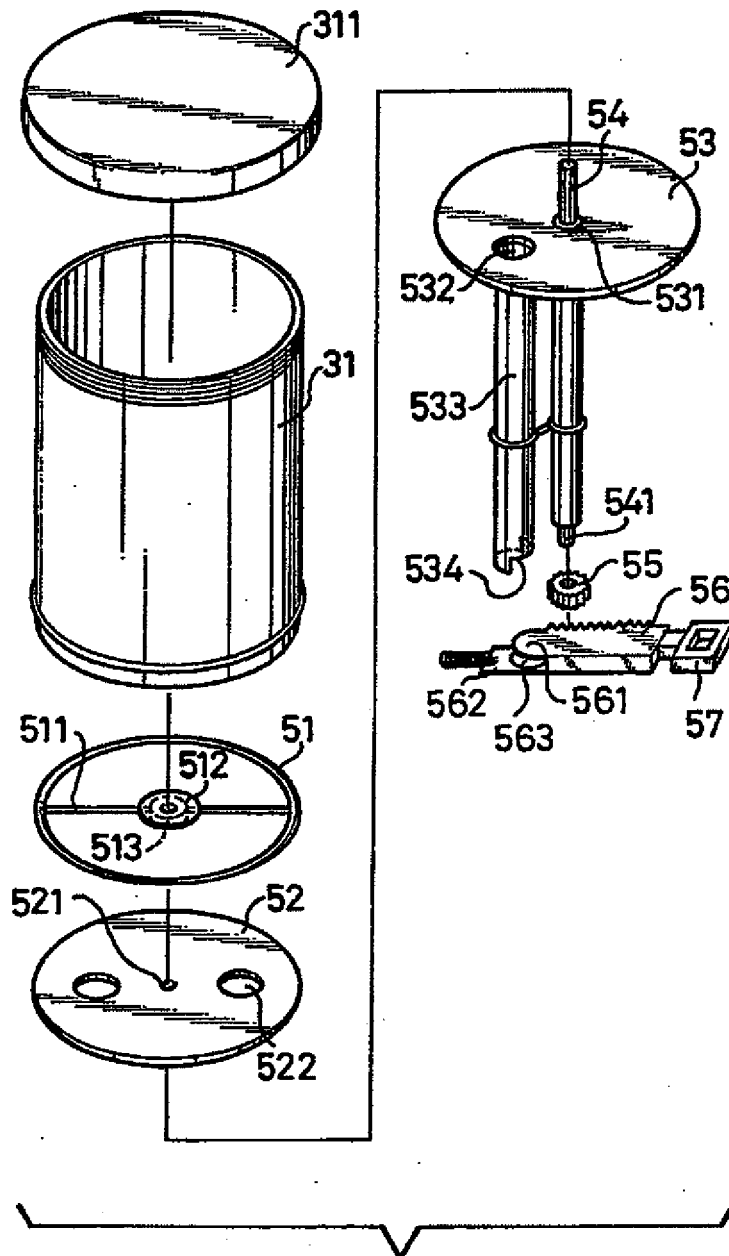


FIG. 2

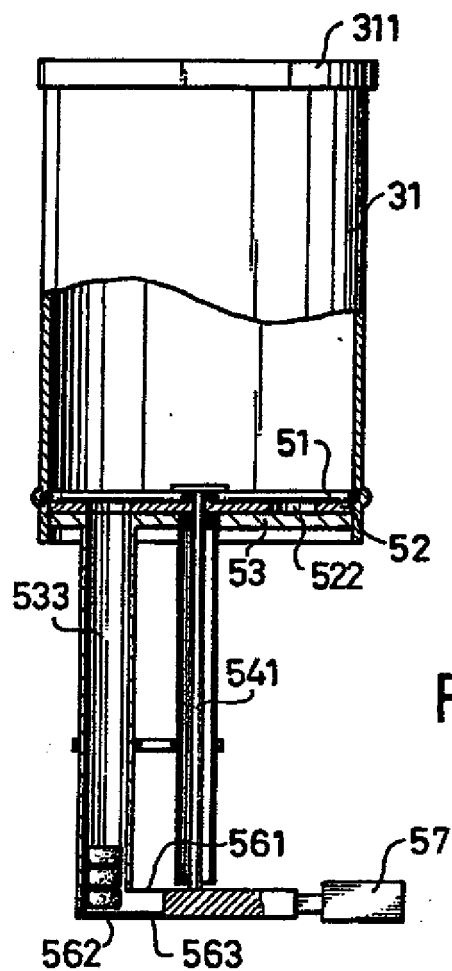


FIG. 3

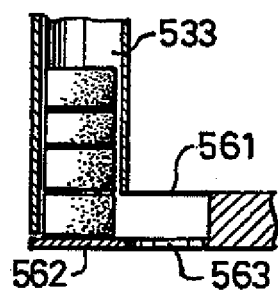


FIG. 4

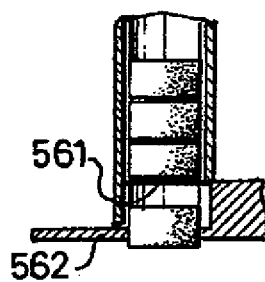


FIG. 5

TITLE: SHAPED MEDICINE DISPENSING DEVICE

BACKGROUND OF THE INVENTION

The present invention relates generally to medicine dispensing device and particularly to a dispensing device for shaped medicines, including tablets, pills, capsules, etc.

Conventionally, when dispensing medicines, pharmacists have to open numbers of bottles, taking medicines out of those bottles and, sometimes, contacting those medicines directly. This increases the risk of contaminating medicines, either medicines inside bottles or those to be packed.

Furthermore, medicine dispensing is a time and labor consuming process.

SUMMARY OF THE INVENTION

It is therefore the object of the present invention to provide a dispensing device for shaped medicines, such as tablets, pills, capsules, etc., so that the risk of the contamination of medicines can be reduced and the efficiency of dispensing medicines is increased.

The advantages of the present invention will become apparent to those skilled in the art upon reading the detailed description provided hereinafter, with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 shows a perspective view of the dispensing device in accordance with the present invention;

05 Fig. 2 is an exploded view of a medicine container;

Fig. 3 is a cross-sectional view of the medicine container shown in figure 2, showing detailed structure of the dispensing mechanism incorporated in the medicine container; and

10 Fig. 4 and 5 are enlarged cross-sectional views showing how a tablet is dispensed out of the medicine container.

DETAILED DESCRIPTION OF THE PREFERRED

Referring to the attached drawings a shaped
15 medicine dispensing device according to the present invention is shown. As noted hereinbefore, the shaped medicine referred to herein may include tablets, pills, capsules, and so on. Tablets 7 are shown in figures 3, 4 and 5 as an example. Pills, capsules and the likes
20 can be handled with the same technique.

Figure 1 shows a general picture of the shaped medicine dispensing device comprising mainly two parts, a control unit 1 and a dispensing unit 2. The control unit 1 is constituted by a main panel 11 and a
25 secondary panel 12. Disposed on the main panel 11 are a plurality of selection switches 13, each of which is

associated with a specific medicine to be dispensed from the dispensing unit 2. Disposed next to each selection switch 13 is an indicator 14 which indicates the selection of the specific medicine associated with the selection switch 13 when the switch 13 is turned on. A counter 15 is also provided on the main panel 11 to count the number of pieces of medicines that have been dispensed. The secondary panel 12, which has the same number of indicators 17 as that of the main panel, is electrically connected to the main panel 11 so that when a specific medicine is selected, an indicator 14 on the main panel 11 and the associated indicator 17 on the secondary panel 12 both show the selection. A secondary panel control switch 18 and a reset switch 19 are also provided on the main panel 11. The function of the former is to power on and power off the secondary panel 12, while the latter is to reset both panels.

The dispensing unit 2 comprises a medicine shelf 3 and a conveyer 4. The medicine shelf 3 is basically stairs-like. Disposed on each stair of the shelf 3 are a plurality of medicine containers 31 each of which is disposed inside a compartment 32. On each compartment 32, an indicator 33, which is similar to those of the main panel or those of the secondary panel, is disposed to indicate if the medicine stored in the compartment 32 is selected. The medicines, when moved out of the medicine containers 31, are delivered to the conveyer 4

via delivering route 34 and main delivering rout 35.
On the conveyer 4, a plurality of U-shaped receivers 41
are disposed to receive the medicine sent out from the
medicine containers 31 and through the delivering
05 routes 34 and 35. Medicines deposited in the receivers
41 can be moved out manually from the opening 42. To
prevent medicines from jumping or falling out of the
receivers 41, it is preferred to construct a shield 43
around part of the conveyer 4 where medicines leave the
10 delivering routes 34 and 35 and enter the receivers 41.

Referring to figures 2 and 3 wherein the detailed
structure of the medicine container 31 is shown, the
medicine container 31 has an opening and a lid 311 to
cover the opening. Medicines are deposited into the
15 medicine container 31 through the opening thereof. An
internal annular groove 310 is formed inside the
medicine container 31 at a suitable distance from one
end of the container 31, which will be hereinafter
referred to as the bottom of the medicine container 31.
20 To move medicines out of the medicine container 31, a
medicine dispensing mechanism, which is constituted by
a ring 51, a rotating plate 52 and a fixed plate 53, is
installed on the bottom of the medicine container 31
with the ring 51, which has approximately the same
25 dimension as the internal groove 310, fixed in the
internal groove 310. In the center of the ring 51, a
hub 512 is fixed with a bearing 513 installed therein

to receive one end of a spindle 54. The rotating plate 52 has a central hole 521 and a pair of feeding holes 522 which are symmetrical about the central hole 521. The fixed plate 53 has a bearinged center 531 and a hole 532 from which a feeding pipe 533 of the same cross section stretches out. The feeding pipe 533 has a semi-circular cut-out 534 at the far end thereof. The hole 532 is located at the same radius as the feeding holes 522 of the rotating plate 52 so that the feeding holes 522 move across the hole 532 of the fixed plate 53 as the rotating plate 52 rotates. The spindle 54 runs through the centers of the ring 52, the rotating plate 52 and the fixed plate 53 with the upper end thereof and extends outwards from the bottom of the medicine container 31 with the lower end 541 thereof. The diameter of the spindle 54 is so designed that it can rotate freely with respect to the ring 51 and the fixed plate 53 due to the bearings disposed therebetween, while the rotating plate 52 is secured on the spindle 54 so as to rotate therewith.

On the lower end 541 of the spindle 54, a pinion 55 is securely disposed to engage with a rack 56 so as to rotate the spindle 54 as the rack 56 is moved. An actuating device 57, preferably a solenoid, is connected to one end of the rack 56 to move the rack 56 back and forth in a direction perpendicular to the feeding pipe 533. At the other end of the rack 56, a pair of tongues 561 and 562, which are approximately

parallel with the direction of the movement of the rack 56, are disposed. The shielding tongue 561 is disposed along one side of the rack 56 while the perforated tongue 562 is along the opposite side of the rack 56.

05 The shape of the shielding tongue 561 is so taken that it is insertable into the feeding pipe from its cut-out 534. The perforated tongue 562 has a hole 563 which is located at such a position that when the shielding tongue 561 is inserted into the feeding pipe 533, the
10 hole 563 is exactly under the feeding pipe 533.

The gear ratio between the pinion 55 and the rack 56 is so designed that when the rack 56 is stretched out, the pinion 55 will rotate half a circle. The relative positions of the shielding tongue 561 and the
15 perforated tongue 562 with respect to the feeding pipe 533 are so taken that when the rack 56 is stretched out, the shielding tongue 561 will penetrate into the cut-out 534 of the feeding pipe 533 and the hole 563 of the perforated tongue 562 will be located under the
20 feeding pipe 533 and when the rack 56 is retracted, the shielding tongue 561 will leave the feeding pipe 533 and the perforated tongue 562 will block the feeding pipe 533. This is shown in figures 4 and 5. Figure 4 shows the condition that the rack 56 is stretched out
25 and the shielding penetrating into the feeding pipe 533 so that the lowermost piece of medicine 7 falls out of the feeding pipe 533 while the other pieces are blocked

by the shielding tongue 561. Figure 5 shows the situation that the rack 56 is retracted back and the opening of the feeding pipe 533 is closed by the perforated tongue 562 so that none of the medicine is
05 able to fall out of the feeding pipe 533.

Since each time the actuating device 57 is energized, the rack 56 is stretched out and rotates the rotating plate 52 half a circle via the spindle 54, one of the feeding holes 522 of the rotating plate 52
10 moving across the hole 532 of the fixed plate 53 so that a piece of medicine stored in the medicine container 31 falls into the feeding pipe 533 while the lowermost piece of medicine within the feeding pipe 533 falls out of the feeding pipe 533 as noted above.

15 With the device described hereinabove, the procedure of dispensing a medicine from the medicine container 31 will be briefly explained as follows: After a specific medicine is selected, the corresponding selection switch 13 is turned on and its
20 associated indicator 14 shows the selection. Meanwhile, the counterpart indicator 17 of the secondary panel 12 also shows the selection for double check. This selection signal will then be sent to the dispensing unit 2 to energize the actuating device 57
25 associated with the selected medicine. The actuating device 57 will then stretch the rack 56 out and, as noted above, a piece of medicine will fall down to the auxiliary delivering route 34 and then be sent to one

of the receivers 41 via the main delivering route 35. Medicines can then be moved out of the receivers 41 at a suitable location and packed.

05 While there has been shown and described what is considered to be the preferred embodiment of the present invention, it will be apparent to those skilled in the art that various changes and modifications may be made without departing from the invention as defined in the appended claims.

IT IS CLAIMED:

1. A shaped medicine dispensing device comprising a control unit and a dispensing unit, said dispensing unit which is electrically connected to said control unit further comprising a medicine storage means and a conveyer, said conveyer having a plurality of receivers disposed thereon, said medicine storage means including a plurality of medicine containers inside each of which a specific medicine is stored, each of said medicine containers having a dispensing mechanism fixed thereon to dispense medicine out of said one of the medicine containers, a delivering means disposed between said medicine storage means and said conveyer to move medicines coming out of said medicine containers to one of said receivers so that the medicines can be conveyed out of said shaped medicine dispensing device; said control unit further comprising a main panel, which has a plurality of medicine selection switches each of which corresponds to a medicine stored in said medicine storage means and a plurality of indicators each of which is associated with one of said medicine selection switches so as to show the selection of the medicine corresponding to said selection switch, said main panel further having a reset switch to reset said main panel.

2. A shaped medicine dispensing device as claimed in claim 1 wherein said control unit further comprising a secondary panel which is electrically connected to said main panel and which has a plurality of indicators, each of which is associated with one of the indicators of said main panel.
3. A shaped medicine dispensing device as claimed in claim 1 wherein said medicine storage means includes a stairs-like shelf with said medicine containers disposed thereon.
4. A shaped medicine dispensing device as claimed in claim 3, wherein each of said medicine containers is disposed inside a compartment with an indicator disposed thereon to flag the selection of the medicine stored in said medicine container.
5. A shaped medicine dispensing device as claimed in claims 1 to 4 wherein each of said medicine containers has an opening for filling medicine thereinto and a lid to cover said opening and keep the medicine inside said medicine container from being contaminated, said medicine container further having an annular internal groove formed therein at a suitable distance from the bottom of said medicine container so as to have said dispensing mechanism installed therein, said dispensing mechanism comprising a ring, which is to be fixed inside said annular groove, including a central hub

with a bearing disposed therein and supported by a plurality of spokes, a rotating plate having a central hole and a pair of feeding holes symmetrical about said central hole, and a fixed plate having a bearinged central hole and a feeding hole located at the same radius as said feeding holes of said rotating plate so that when said rotating plate rotates with respect to said fixed plate the feeding holes of said rotating plate will move across the feeding hole of said fixed plate, a feeding pipe extending from said feeding hole of said fixed plate in perpendicular to said fixed plate, said feeding pipe having a semi-circular cut-out formed at the far end thereof, a spindle running through said bearinged central hole of said fixed plate, said central hole of said rotating plate and said hub so as to rotate said rotating plate with respect to said ring and said fixed plate, said spindle extending downwards and having a pinion fixed on the lower end thereof to engage with a rack, which is connected at one end to an actuating means which move said rack forth and back so as to rotate said rotating plate with respect to said fixed plate and which has a pair of tongues disposed in parallel with the movement thereof at the other end thereof, said pair of tongues comprising a first tongue, which is on the top side

of said rack and has the shape similar to the cross section of said feeding pipe so as to be insertable into said feeding pipe through said cut-out of said feeding pipe and block said feeding pipe, and a
05 second tongue, which has a hole formed thereon at a suitable location so that when said first tongue is inserted into said feeding pipe, said hole of said second tongue will be located at the opening of said feeding pipe, said pairs of tongues being
10 disposed at such relative positions with respect to the opening of said feeding pipe that when said rack is stretched out by said actuating means, said hole of said second tongue is located at the opening of said feeding pipe to allow medicines of
15 a specific amount to fall out of said feeding pipe, and at the same time, said first tongue is inserted into said feeding pipe through said cut-out to prevent more medicine from falling out of said feeding pipe, meanwhile said rotating plate is
20 rotated and one of said feeding holes of said rotating plate is moved across said feeding hole of said fixed plate, thus allowing a piece of medicine stored inside said medicine container to fall into said feeding pipe.

25 6. A shaped medicine dispensing device as claimed in claim 1 wherein said actuating means is a solenoid.